AVIATION

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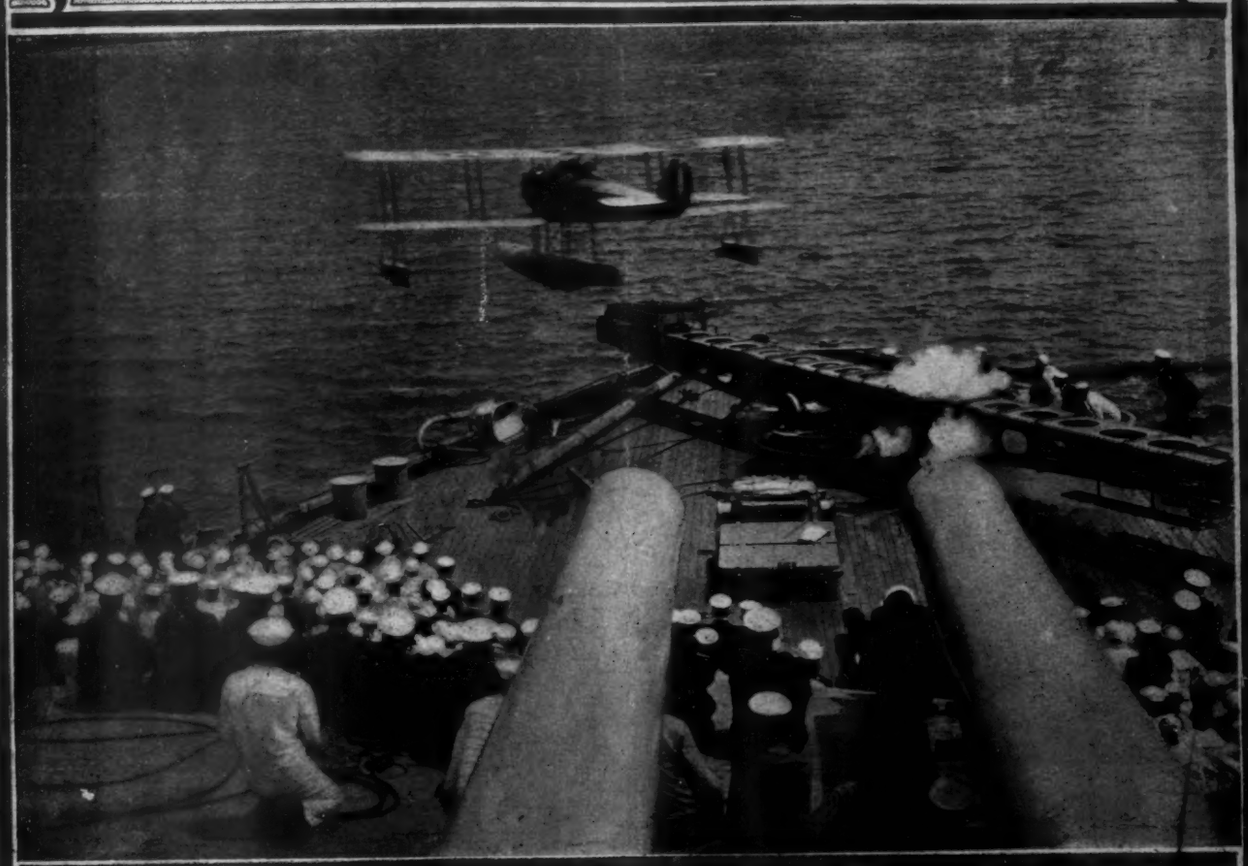

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VOLUME XIII
Number 1

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JULY 3, 1922

AVIATION

VOL. XIII. NO. 1

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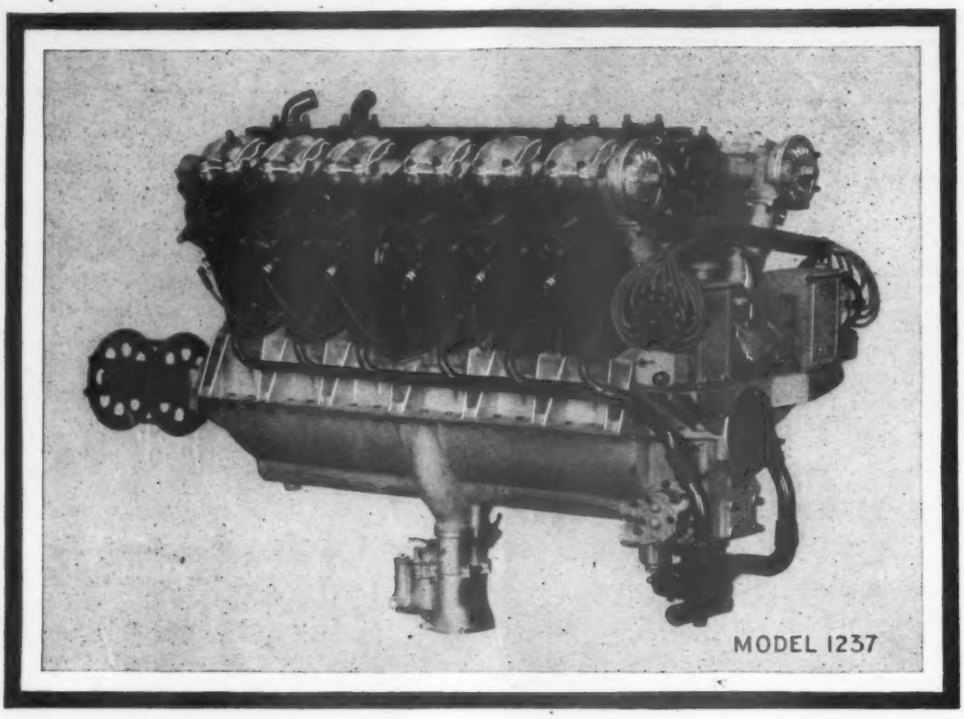

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Vol. XIII JULY 3, 1922 No. 1

Regulating the World's Airways

TREATIES, conventions and like agreements drawn up between nations are, as a rule, cumbersome documents which require a considerable amount of time before they actually become binding. The Convention for the Regulation of Air Navigation of 1919, which was drawn up during the Versailles peace conference and signed by twenty-seven Allied and associated powers, including the United States, did not escape this rule, for to date only fourteen of the signatory states, counting as such the British dominions and India, have ratified the convention. This number, however, makes the convention operative in that it permits of the institution of the International Commission of Air Navigation provided for in the convention.

This permanent commission, which is placed under the direction of the League of Nations, is entrusted with the work of modifying and enlarging the provisions of the convention in the light of practical operation as well as of carrying out various other duties imposed upon it. These "other duties" consist mainly in keeping a record of registered aircraft, of airports of entry and exit, and of restricted areas; establishing standards for airworthiness certificates and radio apparatus to be carried on board aircraft; collecting and disseminating statistical and meteorological information; and insuring the publication of standard aeronautical maps.

It will be seen from this incomplete enumeration that the duties of the International Commission will not only be manifold, and thus necessitate a considerable expense, but also that by the very nature of the work to be done this can be carried out to the best interest of the largest number of "airfaring" countries only by international agreement. There is nothing in the past experience of the human race to approach the speed with which aircraft can obliterate frontiers; hence their movements must necessarily be regulated by worldwide counsel.

The importance of the United States, whether considered from the viewpoint of its population and area, or its wealth and economical enterprise, makes it imperative that we cooperate in this work of making the airways of the world safe for aviation. The state of splendid isolation which the Atlantic and the Pacific afford us is being daily lessened by the unceasing development of aircraft. It follows that we cannot afford to remain outside the net of aerial communication which is gradually encircling us.

With respect to the United States the International Air Convention has so far remained a dead letter, for no ratification has as yet occurred, apparently because the convention is linked up with the League of Nations. If the House of Representatives would pass the Wadsworth Bill instead of letting it peacefully slumber in the Committee on Interstate Commerce, it may perhaps be hoped that the Department of Commerce, in which this bill would create a Bureau of Civil Aeronautics, would take an active interest in our foreign air relations. At the present time the latter subject does not concern, strictly speaking, any government office, save perhaps the State Department, and the latter is certainly not equipped to treat this subject with competence. The War Department and the Navy Department, on the other hand, are only indirectly concerned with this matter since it deals with civil air transport. All of which merely shows the great evil of having the aeronautical activities of the nation distributed among a score of government bureaus.

The Schneider Cup Race

ANNOUNCEMENT of the entries in the forthcoming race for the Jacques Schneider Maritime Aviation Cup discloses, what we had reason to fear for some time, that American aviation will remain unrepresented in this classic seaplane race.

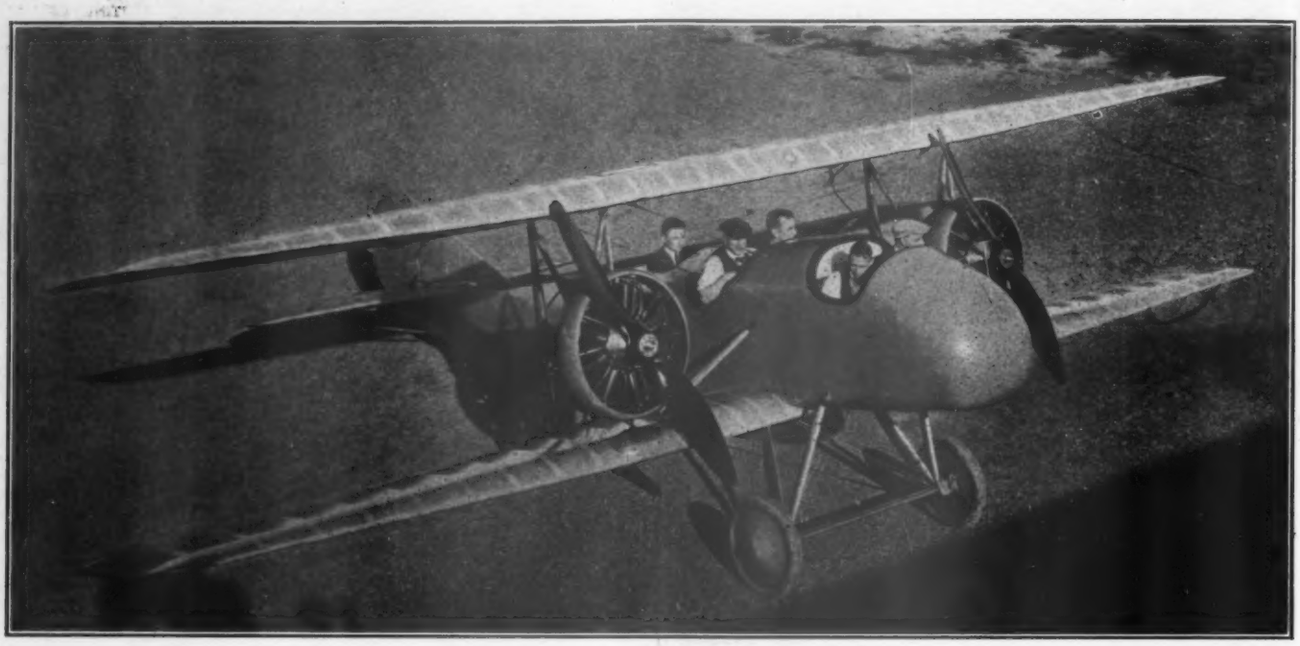
Some six months ago we called attention to the importance of this event and urged American seaplane manufacturers to enter at least one machine in the Schneider Cup race. We said among other things that this would probably be the last chance American manufacturers would have for bringing the famous trophy to the United States. Italy has won the race twice in succession, and if it should again win it this year Italy will become the permanent holder of the trophy.

The two victories of Italian seaplanes in the past Schneider Cup races have materially helped in making the names of Savoia and Macchi known in other "airfaring" countries, and have also been instrumental in obtaining for these firms numerous orders from various governments and airway companies. Indeed, seaplanes of these makes can now be found in the Iberian peninsula as well as in the Baltic and Scandinavian countries, in Switzerland—where they were unknown before—and also in countries which have seaplane manufacturers of their own. This merely shows, what we have consistently maintained here, that aeronautical competitions, particularly when they are international in scope, have a distinct sales value through the large amount of publicity such events receive from the daily as well as from the trade press.

Hence we can but regret America's non-participation in the Schneider Cup race, and in particular the fact that the Navy did not take any initiative in this respect. The sportsmanlike spirit displayed by the Navy in having entries in the last Pulitzer race and in the National Balloon Race, and the Navy's natural concern with seaplanes rather than with land aircraft made us hope to the last that America would not be absent at the coming Schneider Cup race. This not being the case, unfortunately, we can only hope that some other country than Italy may win the Schneider Cup race this year, so that this famous trophy may still remain open for competition.

Elias-Stupar ES1 Commercial Airplane

Twin-Engined Tractor Biplane, Seating Five Persons Built to Meet Requirements of Commercial Operation



The Elias-Stupar Model ES1 commercial airplane, equipped with two 80 hp. Le Rhône engines

G. Elias & Bro., Inc., of Buffalo, N. Y., on May 17 were awarded a War Department contract for two experimental machines of their design for a Type 12 Bomber, which was pronounced by the department as the best plans submitted for the type specified. The Elias company have received several awards for designs, notably these:—June 1, 1920,—$3,000 prize for contract for three machines of their design for Air Service training planes; Nov. 30, 1920—$4,500 prize for the best three-seater multi-motor machine; June 28, 1921—second prize for a shipboard plane, $10,000 by the Navy Department; Aug. 2, 1921—$3,000 awarded for two-seater night observation plane.

Aside from these activities, G. Elias & Bro. have produced for the commercial market the Elias-Stupar ES1 biplane, which is fitted with five seats, including that of the pilot. It is designed to meet all requirements for commercial work; and the cost of operation is estimated to be 3.2 cents per pound load every 100 miles, 8 cents a passenger mile, with baggage; or 5 cents a passenger mile without baggage. Its cruising range with full load is 400 miles. There are 46 cu. ft. of cargo space with 14 cu. ft. additional if necessary.

The following are approximate figures of cost of carrying cargo per 100 miles, based on an assumed distance of 300 miles between terminals.

Fuel and oil	$ 9.00
Pilot	2.50
Upkeep (mechanics, spare parts, etc.)	11.00
Overhead (rental of field, telephone, office assistants, etc. Based on a route where five machines are in use	8.00
Depreciation and insurance	2.50
Cost of transporting 1000 lb. 100 miles	32.00
Cost per pound per 100 miles	3.2 cents

SPECIFICATIONS OF THE ELIAS-STUPAR ES1 AIRPLANE

Span	34 ft. 5¾ in.
Length	24 ft. 4 in.
Height (tail on ground)	9 ft. 4 in.
" (fuselage level)	9 ft. 8 in.
Total wing area (including ailerons)	385 sq. ft.
Aileron area	51 sq. ft.
Horizontal stabilizer	20 sq. ft.
Vertical stabilizer	7 sq. ft.
Elevators	25 sq. ft.
Rudder	14 sq. ft.
Gap	5 ft. 6 in.
Chord	5 ft. 6 in.
Gap chord ratio	1 to 1
Dihedral between motors	0°
Dihedral overhang	2°
Angle of incidence relative to center line of propeller shaft	3°
Angle of incidence with tail skid on the ground.	17°
Engines	160 hp.
Power	2-80 hp. LeRhone
Fuel capacity	86 gal.
Oil "	12 gal.
Seating "	5
Baggage space:—In addition to passenger compartments	10 cu. ft.
Total cargo space when no passengers are carried	46 cu. ft.
Weight empty	1569.52 lb.
Non-pay useful load, consisting of:	
Students control	4.50
Cushions, except pilots	36.69
Safety belts " "	6.00
Fire extinguishers	20.00
Gasoline (3 hr. supply)	360.00
Oil " " "	72.00
Pilot	162.00
Total	675.88
Pay load	955.60
TOTAL, useful load	1631.48 lb.
Total weight of machine fully loaded	3200.00 lb.
Light load (definition) Minimum weight of machine for one half hour flight consisting of	
Weight of machine empty	1568.52
Pilot	160.00
Fuel for ½ hr.	60.00
Oil " "	12.00
TOTAL	1800.52 lb.
Wing loading, light load (1800 lb.)	4.80 lb./sq. ft.
" " full load (3200 lb.)	8.55 lb/" "
High speed, light load	90 m.p.h.
High speed, full load	90 "
Landing speed, light load	35 "
Landing speed, full load	50 "
Climb, full load	400 ft. per min.
Climb, light load	1000 ft. " "

Introducing the Two-Way Airplane

By John B. Flowers

Aeronautical Engineer, U. S. Naval Aircraft Factory

The idea of a "two-way airplane" proposed by Mr. Flowers, while wholly speculative, embodies a number of interesting points which seem to warrant its publication, if for no other reason than to stimulate thought along these lines. It should be noted that Mr. Flowers does not claim the design to be more than tentative, as may also be seen from the imaginative picture of a dual-tail flying boat shown in this connection, which was obtained by photographic composition.

A criticism of the idea of a "two-way airplane" by a well-known aeronautical engineer, is appended to Mr. Flowers' Communication.—EDITOR.

There has long been a demand for a plane which could start and stop in a short distance. Many landing fields are short and narrow, which has caused perhaps more fatalities, due to planes striking obstructions, than any other cause. The same problem arises in landing on a ship where the space for starting and landing is very limited.

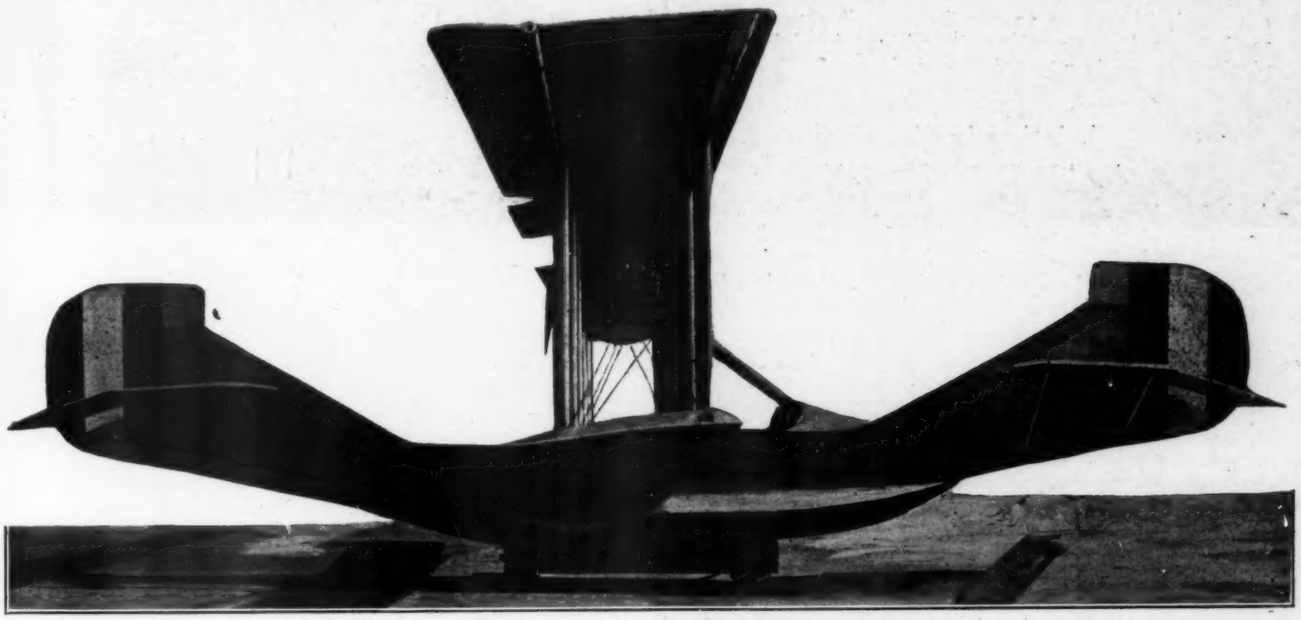
The two-way airplane was designed to overcome these difficulties. It is an adaptation of the present form of airplane. From observation of the photograph, it will be noticed that the wings have a trailing edge which has the same thickness as the leading edge. The plane has one Liberty engine of 400 hp. which is connected by clutches to a right handed propeller at one end of the engine nacelle, and to a left handed propeller at the other end. When it is desired to go forward, the bow propeller is connected by a simple clutch to the engine; to go backward, the stern propeller is connected by a clutch to the engine, by throwing a hand lever.

The two-way airplane can be started with either end forward. The forward propeller is thrown on to the engine by means of a clutch, the engine is then started in the usual way by either a hand or self-starter, and the flight started. Suppose it becomes necessary to back out of an encounter with the enemy. The airplane is pointed slightly upward, the engine is shut down to slow speed, the forward propeller thrown out of clutch with the engine, and the rear propeller thrown in clutch with the engine. The engine speed is raised to full speed immediately, and the airplane suddenly reverses its direction without turning around.

Landing in a short distance is accomplished by reducing the speed of the engine, throwing the forward propeller out of clutch with the engine, and the rear propeller in clutch with the engine. The full thrust of the rear propeller stops the airplane in an extremely short distance.

The accompanying illustration shows the idea adapted to a seaplane. It is obvious that the same ideas are even more useful on a land plane.

The main advantage of this idea is that the plane can be stopped in an extremely short distance by throwing in the rear propeller and speeding up the engine. It is believed that the action of a rear propeller pulling backward to stop the plane would be less apt to turn the plane over, than the use of a reversible propeller in front of the plane. In this way the extra propeller is superior to the use of a reversible propeller.



An imaginative picture of what the "two-way airplane" idea might look like adapted to a flying boat of standard construction

For new maneuvers in the air, this plane would be useful. The flying back and forth in the air without turning the plane around, the quick stop and start, all would be novel and exhilarating. The aviator would fly forward, shift clutches, turn around on his swivel chair, and come flying back in the same path. It could also be used for circus and show purposes where peculiar flying is desired.

For police work around city harbors where after coming up to the dock it is desired to go out immediately again after harbor thieves without delay in turning around, it would be ideal.

The drag of the extra propeller would be very little as it would rotate idly on ball bearings when not clutched in on the engine and its resistance would not be greater than that of a stream lined strut. Dual controls would be necessary, but many planes now have at least the equivalent of part dual control. The reversal of speed would be accomplished in so small a time that the usual effects of a stall would not be noticeable.

Criticism of the Idea

The following comment on the "two-way airplane" idea has been received by AVIATION from a well known aeronautical engineer:

"So far as quick stopping is concerned, the proposition would appear to be more simply solved in the reversible propeller. The shifting of clutches at a critical point in battle, with only a few seconds to work in, would require very quick action, or an automatic shift, rather difficult of realization. It would further appear necessary to lock the front rudder automatically at the same time the reversal took place, as otherwise difficulty might be expected with controls.

"There would be further difficulty with the shift of the center of pressure. It is hardly to be expected that it will remain in the same position on reversed controls unless the stabilizer setting permits of the center of gravity location at the center of the chord. It would further appear desirable for the pilot to sit on a swivel chair so that he could turn around and face the new direction. This means dual controls. Another interesting point is that the plane has to pass through zero speed at which time it would probably meet with the usual consequence of a stall, although the time of transition might be small enough to greatly reduce the usual effects.

"Altogether, as far as surprising the opposing enemy is concerned, it appears to me the reversible propeller could produce equally as good results without involving the complexity I foresee in attempting to work out Mr. Flowers' idea."

Aviation in Congress

April 12, 1922 — June 2, 1922

April 12 *House*
Mr. Sisson discusses the Navy Bill (H.R. 11228). He believes the battleship is dead and has been supplanted by the airplane. He believes that the nation that controls the air controls the sea and the nation that controls the sea, controls the world.

May 2. *House*
Mr. Oldfield: A bill (H.R. 11515) providing for the purchase of certain inventions, designs, and methods of aircraft, aircraft parts, and aviation technique of Edwin Fairfax Naulty of New York; to the Committee on Appropriations.

May 8. *House*
Conference report of the Post Office Bill (H.R. 9859) submitted. In amendment No. 40, $1,900,000 is provided for air mail service.

May 9. *House*
Brief filed with the Department of Justice by the Contract Audit Section of the Air Service in the Lincoln Motor Case printed in the record.

May 13. *House*
Post Office Bill (H.R. 0859) Appropriation of $1,000,000 for air mail passed House.

May 15. *House*
Discussion of aircraft contracts in the consideration of H.R. 11645 a bill providing appropriations for the prosecution of the war contracts.

May 17. *Senate*
The Vice President laid before the Senate a communication from the Secretary of War, transmitting in response to S. Res. 266 information relative to a school of aeronautics, which was referred to the Committee of Military Affairs.

May 2. *House*
Mr. Hicks in H.R. 11214, a bill authorizing the President to scrap certain vessels in conformity with the provisions of the Five Power Naval Treaty urges the converting of two battle cruisers into aircraft carriers.

May 20. *House*
Mr. Jeffries of Nebraska; a bill (H.R. 11723) to authorize and provide for payment of amounts expended in construction of hangars and maintenance of flying fields for use in the Air Mail Service of the Post Office Department; to the Committee on Post Office and Post Roads.

May 27. *House*
Mr. Hicks unanimous consent to lay on the table H.R. 5219, a bill to create a Bureau of Aeronautics in the Department of the Navy, and the Bill H.R. 6297 authorizing the construction of an airplane carrier for the Navy of the United States.

May 31. *Senate*
Vice President laid before the Senate a communication from the Acting Secretary of the Navy, transmitting in further response to Senate Resolution 266, agreed to April 5, 1922, information relative to the establishment of an academy of aeronautics at the Naval Academy and the manufacturer of aircraft at naval stations, etc. which was referred to the Committee on Naval Affairs and ordered to be printed.

June 2. *Senate*
War Department appropriations (H.R. 10871). Aircraft appropriations amendments agreed to. Amendment allowing $400,000 for helium experimentation reduced to $300,000 and agreed to.

—Aeronautical Chamber of Commerce

British Racing Airplane Fitted with Air-Cooled Engine

Bristol racing monoplane, fitted with a 100 hp. Bristol "Lucifer" 3-cyl. radial air-cooled engine, which won the Whitsuntide Handicap at the recent Croydon flying meet

Greater Safety for Air Travellers

Voluntary Adoption by Airways of Radio or Carrier Pigeons Would be a Desirable Step

Pending the enactment of federal legislation for the regulation of air navigation the National Advisory Committee for Aeronautics in a resolution adopted May 20, 1922 calls upon the operators of aircraft voluntarily to equip their aircraft to promote the safety and comfort of passengers. It is the committee's opinion that the suffering and loss of life attending forced landings of aircraft on land or water can in all probability be lessened by making use of existing knowledge and facilities. To this end the committe urges "that large seaplanes should be provided with wireless and other signaling equipment, be seaworthy as well as airworthy, and carry at all times fire extinguishers, life preservers, a first-aid kit, and a supply of food and fresh water; that airplanes operating over the land should carry wireless or other signaling apparatus, fire extinguishers, and a first-aid kit."

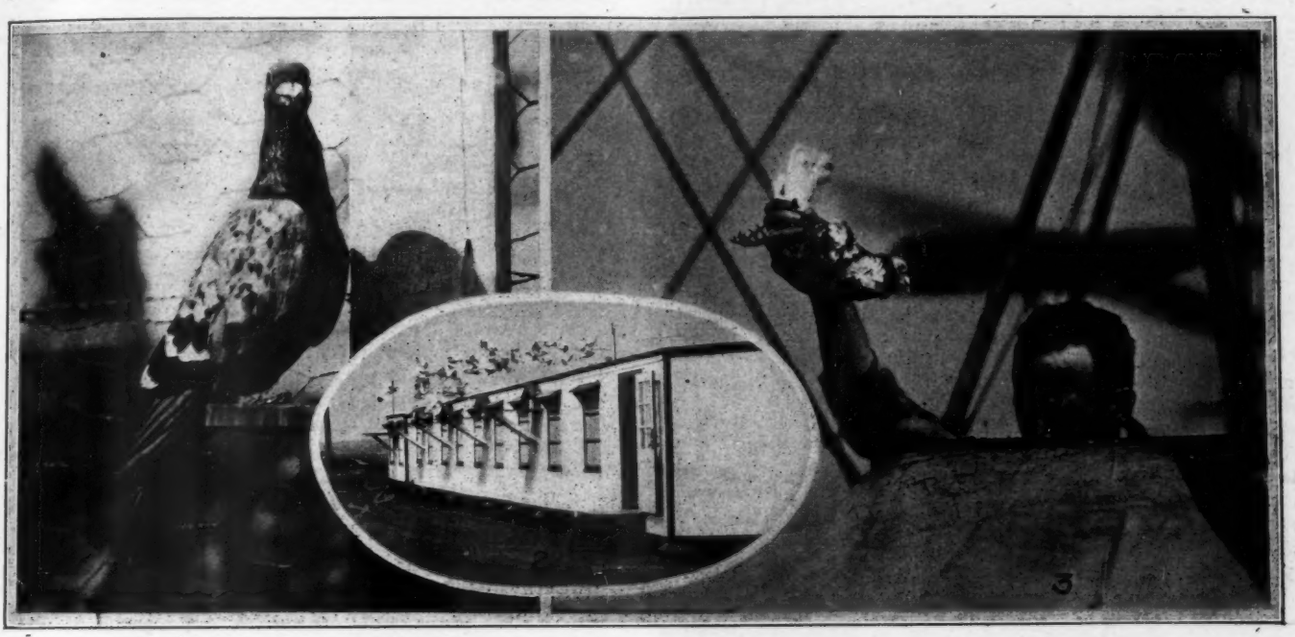


Fig. 1. "Seaplane," one of the Navy's best carrier pigeons— Fig. 2. The main naval pigeon breeding loft, at Anacostia, D. C.—Fig. 3. How a pigeon is released from a seaplane

It is understood that the accident to the "Miss Miami" in which four persons lost their lives, for want of reasonable precautions to provide for the safety of air travellers, prompted this action by the National Advisory Committee for Aeronautics. Legislation for the regulation of air navigation is now pending in Congress.

A Timely Suggestion

The Bureau of Aeronautics, Navy Department, on the other hand, urges that all passenger-carrying seaplanes be equipped with radio, or, if this is not feasible, that they carry on board messenger pigeons, the expense of which is limited.

Passenger-carrying seaplanes are a public utility and as such should be required by law to possess means of communication for the protection of their passengers in case of emergency. Pigeons are very valuable in this respect, whether radio is used or not. In the Naval Air Service every aircraft, before it takes off for a flight, no matter for how short a distance, must carry four homing pigeons.

In its aerial messenger service the Navy has about 2000 homing pigeons distributed through the country at all Naval Air Stations, and trained to the locality, in other words, acclimated. The principal Navy loft is at Anacostia, D. C., where about 300 birds are kept in training. This is the principal breeding loft of the Navy and is kept as spick and span as the bridge of a flagship. The Navy also has pigeon lofts at San Diego, Calif., Pearl Harbor, H. T., Guam and Porto Rico and other points.

Its pigeons are the best in the country, trainers of the Navy's feathered messengers insist, pointing out that no Navy bird has ever been beaten in a poultry show in its class, and that many flying records, including the average speed record for young birds are held by the Navy's racers.

Among the instances where a pigeon has been instrumental in securing aid for disabled seaplanes, is the case of a plane forced down off the New Jersey coast several months ago. A pigeon from Cape May station released by Ensign Finch from his plane, when about 45 miles from Atlantic City, notified the station of his predicament and aid was dispatched to him. There are numerous instances of this sort on record especially at the Pensacola and Anacostia stations. Sometimes it is only a spare part that is called for in the message on the bird's leg and in that case a relief plane carries the part at once to the plane in distress.

Pigeons on All Aircraft Carrying Ships

Today the Navy is introducing pigeons on all its aircraft-carrying ships, a feat never before successfully attempted by any nation, due to the difficulty in habituating the pigeons to a floating home. This is now being done on the aircraft tenders. Anacostia is breeding a quota of 75 young birds for the airplane carrier Langley and expects to deliver them to the ship at Hampton Roads within the month. A like flock is being trained for the aircraft tender Wright.

Naval pigeons from the Anacostia loft have won races in competition with birds from all Washington Clubs in the Washington Concourse Association. Incidentally Naval entrants have won many races in competitions from race points from 100 to 500 miles out of Washington.

Among the feathered stars of the Navy is "'Admiral," who beat all Washington birds in a 400-mile flight, by 25 min. The race, which took place last year, started at Deshler, Ohio, and finished at the capital.

"Skipper," another Navy bird, won a 300 mile race, making an average speed of 1601 yards per minute. Another flew successfully 600 miles over water from a ship to the shore.

"Seaplane" is considered one of the Navy's best birds. Some time ago this homer flew from Chicago to Hampton Roads, a distance of 700 miles, establishing a record for the state of Virginia.

More recently the Navy pigeon, "Aero Queen" won the 400 mile race from Deshler, Ohio, to Washington, while "Velocity" came second. Flying against an east wind it took them about 12¾ hr. to complete the journey, which is considered a meritorious flight inasmuch as the two birds are only one year old, and were competing against some of the best trained birds in Washington. The average speed made per minute was 926 yd.

On June 11, "Radio Queen," an eleven months old Navy pigeon won first place in a 500 mile race to Washington from Charlottesville, N. C., at the same time this pigeon completed the winter record of seven places for the Navy fliers in recent races.

To date the Navy's feathered messengers have won six places in five events for older birds of local clubs, being first in the 100 mile race, first in the 200 mile flight, third in the 300 mile event, first and second in the 400 mile competition, and first in the 500 mile race, besides winning first place in the 500 mile young bird event mentioned above.

The race of June 11 was the last race of the year, and "Radio Queen" finished in 12 hr. 49 min., 16 minutes better than any Washington bird although over a new course. She averaged a speed of 1150 yd. per minute in her long trip to Anacostia from the South.

Commercializing the Airplane Engine

Lighter Engines per Hp. Requiring Less Space with Increase of All Around Efficiency and Reliability

By A. L. Fullerton

What the world war did for the development of the aero engine in a short length of time, commerce will in due time do for the present types of airplane engines, but the development must necessarily be slower, owing to the lesser demand. The prevailing high prices of aero engines being primarily due to the expensive materials and high grade workmanship employed, the change from the present type, of performance at any cost, to performance at the least cost, must come if aviation is to be widely commercialized and become an important functioning part of the business world.

Therefore, an important point in connection with the designing of engines is the cost of construction. The present types of successful airplane engines are too costly for the average commercial planes which are in demand. Water-cooled engines are at a decided disadvantage in comparison with engines which are air-cooled, an addition of about 20 to 25 per cent of the weight of the engine being necessary for water cooling. Now, one square foot cooling surface is more valuable for cooling than a sq. ft. of radiator tube. Furthermore the danger of having the water cooling system fail in flight is considerable, there being more chance of overheating with the water cooled engine than the air cooled, as a failure of any part of the water system will cause the engine to overheat, which may mean a seized engine in a very short time.

Air-cooling may not greatly affect the weight of the engine proper, but it would entirely do away with the radiator, together with its power-consuming head resistence, the water and pump with all the attendant pipings and fittings. This means a considerable saving in the total weight of the power plant and a simplification in the arrangement of the installation, making for greater accessibility, reducing the overall dimensions of the powerplant, and increasing overall efficiency and reliability.

Cheaper Power Plants Wanted

For commercial work the demand will be for a cheaper engine. This will necessitate a certain sacrifice to weight owing to the use of cheaper materials in certain places where the cost of construction does not warrant the slight saving in weight obtained by special steels or alloys. This will be offset by greater compactness and less weight per horsepower due to improvements in the new designs of engines, without any sacrifice to performance.

The overall dimensions of the present engines are a drawback to the further refinement of the fuselage. If the proper body form is maintained it must be unnecessarily large, in order to house the engine, or portions of the engine must be left exposed, either of which materially effects the performance, subtracting from its overall efficiency as a commercial plane. The exposure of cylinders and radiator offer great resistance, and require a considerable percentage of the power necessary for penetrating the air. This becomes more and more important with the higher speeds which designers are striving for, as one of the greatest assets of the commercial plane. Greater head resistance means slower speed and the need of more power, either of which requires a greater fuel capacity with less overall efficiency.

Advantages of the Two-Cycle Engine

The present types of four-cycle engines have apparently been perfected as far as perfection seems possible with poppet valves; however, the scavenging of the cylinders does no more than approach the compression ratio which, if completed, would mean an increase of power of from 20 to 25 per cent. over the present engines. It is the writer's personal opinion that the two-cycle principle is more efficient than the four-cycle, and the reasons for its disuse are not because of the principle but because of faulty engine designs in scavenging, preventing losses of the mixture and backfiring. It is likely but a question of time before two-cycle engines will come into use again with a possible increase in performance over four-cycle engines of the same displacement of from 90 to 100 per cent. with possibly an increase in efficiency.

Two-cycle engines are more difficult to cool than the four-cycle engine because of the greater number of working strokes. However less compression will be necessary to accomplish the same results as obtained from four-cycle engines. This wou'd be a big improvement in itself as high compression engines, if run for long at full power on the ground at low engine revolutions, are liable to detonate badly. This wou'd also be overcome to a certain degree with the two cycle engines.

In conclusion, the commercial demand will be for a cheaper engine, of considerably less weight per horsepower, much more compact, and with greater simplicity and accessibility. Possibly some radical changes in the arrangement of the major components, or the adoption of the two-cycle principle will take place. Else we may see the perfecting of the air-coo'ed engine, with an increase in the overall plant efficiency to equal or surpass the water-cooled engine, the efficiency of the engines keeping step with the gradual improvement in design.

The Bleriot Spad 45 Four-Engined Airliner

French Airplane Fitted with Four 275 hp. Hispano's Accommodates Seventeen Passengers and Crew of Three

By John Jay Ide

The Spad 45 transport airplane, fitted with four 275 hp. Hispano-Suiza engines, is designed to carry seventeen passengers and a crew of three.

In the nose of the fuselage is the station of the navigator with the wireless telegraph, signal and navigation instruments. Aft of the navigator and forward of the wings are two pilots placed side by side and having excellent visibility. Behind the pilots and at the center of gravity, a large cabin between the planes of rotation of the forward and aft propellers is arranged for fifteen persons. Under the floor of this cabin there is a large luggage hold containing a mechanic's seat. While the machine is in flight the mechanic can visit the two engine nacelles to make small repairs. Aft of the main cabin there is a lavatory and a double seat permtting two passengers to travel in the open air.

The central part of the cellule has forward stagger, the swept back upper plane being 3.3 ft. forward of the lower plane at the center. The lower plane is in three parts with a straight leading edge. Two symmetrical ailerons, controlled by a lever and crank arrangement, are placed at the outer rear corners of the lower plane.

The two planes have a gap of 10.6 ft. and are connected by two struts (one on each side of the fuselage). To reduce head resistance the bracing wire terminals are in the thickness of the wings.

The monocoque fuselage is composed of two layers of strips of tulip wood 20 mm. in thickness and one layer of spruce 40 mm. thick and covered with fabric on the outside.

The landing gear is composed of two panels of several thicknesses of hardwood and covered with fabric. These panels are connected at their lower end by two steel tubes between which lies the divided axle. There are two wheels arranged in tandem attached to each end of the axle by a special mounting permitting the contact of all four wheels with the earth regardless of the irregularities of the terrain. A strut runs from each side of the landing gear to the lower wing directly under each engine nacelle. The wheels are 1000 x 180 mm. (3.28 x 0.59 ft.). Streamline wire cross bracing assures the rigidity of the structure.

The ash skid attached to the rear of the fuselage is in two parts: an upper fixed portion and a lower pivoted portion. The latter has a rubber shock absorber and a steel skid.

The rudder and elevator are connected to the controls by steel cables in duplicate. The stabilizer and fin are adjustable in flight.

The four engines are arranged in two groups of two in tandem and are placed on the lower plane on each side of the fuselage. The engine nacelles are easily removable and thus permit the use of any engine, the nacelles being interchangeable.

The Blériot Spad 45 transport airplane, with the wings uncovered to show internal construction, as it was exhibited at the last Paris aero show

CHARACTERISTICS OF THE SPAD 45

Biplane with two tractor screws and two propellers.
Four 275 hp. naval type Hispano-Suiza engines.

Span	70.5 ft.
Length	50.2 "
Height	19.0 "
Wing area	1560 sq. ft.
Weight empty	7700 lb.
Fuel load	3080 "
Passengers, baggage, etc	4620 "
Total weight	15400 lb.
Wing loading	9.8 lb./sq. ft.
Power loading	14.0 lb./hp.
High speed	124 m.p.h.
Endurance at full power	5 hr.

Warning to Aviators

Because of the construction of airship hangars in progress at Wilbur Wright Field, Fairfield, Ohio, and the operation of airships and captive balloons at that station in connection with the activities of the Engineering Division, Air Service, pilots should look this field over thoroughly before attempting to land.

Pilots should be particularly watchful to avoid *collision with captive balloon cables,* the position of which in the air will be plainly marked by danger cones displayed on the cables.

—Notice to Aviators No. 5, 1922

WAR DEPARTMENT

JULY — AUG.

JULY 6—Q. M. SUPPLIES—San Antonio, Tex., Auction. For catalog write, Q.M.S.O., Ft. Sam Houston, Tex.

July 7—Q. M. SUPPLIES—Washington, D. C., Auction. For catalog write, Q.M.S.O., 1st. Ave. & 59th. St., Brooklyn, N. Y.

July 11—AIR SERVICE SUPPLIES—Buffalo, N. Y., Auction. For catalog write, C. O., Curtiss-Elmwood Depot, Buffalo, N. Y.

July 12—Q. M. SUPPLIES—San Francisco, Calif., Auction. For catalog write, Q.M.S.O., Gen. Intermed. Depot, Ft. Mason, San Francisco, Calif.

July 13—Q. M. SUPPLIES—Omaha, Neb., Auction. For catalog write, Q.M.S.O., 1819 W. Pershing Rd., Chicago, Ill.

July 20—Q. M. SUPPLIES—Columbus, O., Auction. For catalog write, Q.M.S.O., 1819 W. Pershing Rd., Chicago, Ill.

July 25—Q. M. SUPPLIES—Camp Jackson, S. C., Auction. For catalog write, Q.M.S.O., Candler Warehouse, Atlanta, Ga.

July 28—Q. M. SUPPLIES—Philadelphia, Pa., Auction. For catalog write, Q.M.S.O., 1st. Ave. & 59th. St., Brooklyn, N. Y.

Aug. 1—Q. M. SUPPLIES—Schenectady, N. Y., Auction. For catalog write, Q.M.S.O., 1st. Ave. & 59th. St., Brooklyn, N. Y.

Aug. 3—Q. M. SUPPLIES—Camp Grant, Ill., Auction. For catalog write, Q.M.S.O., 1819 W. Pershing Rd., Chicago, Ill.

SEND FOR CATALOG

SELLING PROGRAM

JULY — AUG.

In checking over the accompanying program of sales, note that the designation "Q. M. SUPPLIES" is a cloak to a list of 65,000 commodities. Not all of this great number is included in each sale, of course. Nor will the manufacturer and dealer in the aero field be interested in all of the 65,000 items. Your individual needs govern your purchases. Catalogs of each sale will guide you to wise buying.

Sales listed as "AIR SERVICE SUPPLIES" will present some or all of the following commodities:

Planes and parts; motors and parts; linen and cotton fabrics; scrap steel, iron, bronze, aluminum and brass; helmets, goggles, flying suits and leather coats; oils and lubricants; cameras, kodaks, lenses, chemicals, compasses, stop-watches, clocks, propellers, welding outfits, etc.

SEND FOR CATALOG

BY NEGOTIATIO

During July and Augu Chicago, Ill., the War D ment is conducting one greatest sales of machine it has ever held. A great riety, and large quantiti machines are offered. Se full information to Chi Chicago District Ordnance vage Board, 7400 South land Ave., Chicago, Ill.

The Government serves the right reject any or all bi

WAR DEP

Better Business

Your hand can dam the mighty Mississippi at its source. Lift your hand, and the labors of a nation cannot halt the majestic sweep of the waters near their mouth.

Business is like the Mississippi. Remove the barrier at the source of supply, and the stream of trade will grow in volume as the rivulet becomes the river.

The War Department today is the greatest single source of supply the business world has ever known. Impounded in its warehouses are millions of dollars worth of materials—bought to meet the acid test of use by your Army in the struggle "over there". Their nature is as varied as the demands of diversified industry.

Better business depends in large measure upon unhindered distribution of this surplus in the channels of trade. Do your part in releasing these stores. The catalogs of offerings show the way. Write:

Chief, Sales Promotion Section, Office, Director of Sales
Room 2515, Munitions Bldg., Washington, D. C.

PARTMENT

Admiral Fullam in Spokane

Interest in aviation in Spokane, Wash., has been substantially stimulated as a result of a visit to the city of Rear Admiral W. F. Fullam, U. S. Navy, retired. The Admiral, who is making the circuit of Army corps areas as the representative of the National Aeronautical Association, makes an exceptionally efficient envoy for the organization which planned the tour.

Arriving at Spokane early on the morning of June 5, Admiral Fullam was met at the depot by a delegation of representative citizens, including the mayor of Spokane and president of the chamber of commerce. The military affairs committee of the chamber of commerce is especially charged with the development of aviation in Spokane, and the committee was well represented in the reception committee. Thereafter Admiral Fullam's time was fully occupied. He spoke at the high school auditoriums, addressed the chamber of commerce, spoke to the garrison at Fort George Wright and was entertained at luncheons and dinners. The newspapers devoted a large amount of space to his visit with illustrations.

Determination to place the Spokane municipal aviation field at Parkwater in line with the best fields in the northwest was expressed subsequently in a discussion of aviation by members of the city park board.

Adoption of rules to govern the air was delayed until after action is taken by the National Aeronautical Association at its convention at Detroit, in September, when national-wide flying rules are to be adopted in conjunction with the Army and the Navy. Temporary rules will be adopted to govern fliers using the Parkwater municipal field this year. It was voted to make the fee for the season $5 a ship and to have the permit revocable by the park board at any time. All permits are to be issued subject to such rules as the board may adopt.

Commercial Aero Association

Seventh Corps Area

The Commercial Aeronautical Association of the Seventh Corps Area has had its Constitution and By-Laws printed in a neat booklet, which will be supplied to anyone interested, on applying to Ralph W. Cram, Davenport, Iowa, president, or John B. Coleman, Sioux City, Iowa, secretary of the organization.

The Association is organized to promote the interests of aviation, the location of landing fields, and to do everything possible for the development of commercial aviation in the eight states comprising the Seventh Corps Area. It expects in September to become a District of the proposed National Aeronautical Association to be organized at Detroit.

Brief Trade Notes

Four new VE9's were delivered by the Chance Vought Corp. of Long Island City, N. Y., to the Navy Department on June 24 for shipment early in July on the U. S. battleships Maryland and Nevada to the World's Exposition at Rio de Janeiro, Brazil. These planes will be exhibited by the Navy Department at the exposition and will participate in various flying events which are scheduled during the exposition. The VE9 is the standard Army and Navy advance training machine. It is a two-seater equipped with 180 hp. Wright E2 engine.

The Lincoln Standard Aircraft Co. of Lincoln, Neb., has delivered two more Lincoln-Standard Tourabouts to Ralph C. Diggins, of the Diggins Aviation School at Chicago. This makes the third machine delivered to Mr. Diggins in ten days, and makes the tenth Lincoln Standard put out by this factory in the last thirty days.

The Cox-Klemin Aircraft Corp. of College Point, L. I., has sold an MF type flying boat to an Akron man who has engaged a pilot for using this ship in passenger carrying work over the Akron city reservoir.

The International Air Convention

Representatives of the British, French and Belgian civil air departments held a conference in Brussels on May 19 and 20 to discuss various matters affecting international air navigation. The principal subject examined was the ratification of the International Air Convention of Oct. 13, 1919, and the appointment of the International Air Navigation Commission, provided for in Article 34 of said convention.

Fourteen of the states which signed the convention of 1919, namely, Belgium, Bolivia, Great Britain, Canada, Australia, The Union of South Africa, New Zealand, India, France, Greece, Japan, Portugal, The Serb-Croat-Slovene State and Siam have been invited to deposit their ratifications with the French Ministry of Foreign Affairs by June 1, 1922. For these states the convention will become binding forty days after the deposit of ratification, that is, on July 11, 1922. It is hoped that the example given by these states will prompt the other signatory states who have not yet ratified the convention to do so, and that it will also encourage non-signatory states to become parties to the convention.

The signatory states which have not yet ratified the convention are: Brazil, China, Cuba, Czecho-Slovakia, Equador, Guatemala, Haiti, Hedjaz, Honduras, Italy, Liberia, Nicaragua, Panama, Peru, Poland, Rumania, United States and Uruguay.

As soon as the fourteen states above named deposit their ratifications the French government will, in accordance with Article 34 of the Convention, call the first meeting of the International Commission of Air Navigation. This measure is very important in view of the prompt application of the convention, as various international problems will have to be solved before the end of the year owing to the fact that the aerial relations of the allies and the ex-enemy countries will by that date cease to be governed by the peace treaties. Two of the ex-enemy states, Austria and Bulgaria, can already adhere to the convention as they have become members of the League of Nations.

The creation of the International Commission will also permit of the application of the so-called "protocol" whereby states which remained neutral during the late war are authorized to adhere to the convention without observing Article 5. This article provides that states signatory of the convention will not authorize aircraft of non-signatory states to fly over their territory. As this provision was practically inapplicable by ex-neutral states since it would have brought about retaliation by the ex-enemy states, no neutral adhered to the convention. The protocol in question answers the objections of these neutral states.

The Schneider Cup Race

For the Jacques Schneider Maritime Aviation Cup race which will take place in August at Naples eight entries have been received by the Aero Club of Italy up to May 31, last, the closing date for entries. The entries include five Italian, two French and one British machines.

The Italian machines are: two Macchi flying boats, fitted probably with 500 hp. Fiat San Giorgio engines; two Savoia seaplanes, one of which will be a flying boat, while the other is believed to be a Vickers-Terni-Marchetti biplane on floats, the construction of which was recently taken over by the Savoia company; and one Pegna seaplane, entered by the newly formed firm Pegna-Bonmartini-Cerroni. The latter firm was created last May for the purpose of manufacturing aircraft to the designs of Signor Pegna, who designed the four-engined P.R.B. flying boat which has put up an excellent performance in Italy.

The two French entries are either two Cams flying boats fitted with 300 hp. Hispano-Suiza engine, or one such machine and a Nieuport-Delage racer fitted with floats. (The Cams company manufactures flying boats under license from the Savoia firm.) The British entry is presumed to be a Supermarine flying boat, unless it is the Gloucestershire "Bamel," fitted with a 450 hp. Napier "Lion" engine and equipped with floats.

ARMY AND NAVY AIR NEWS

Air Service

Chief of Air Service at Carlstrom Field—Two planes were flown to Miami on May 18, to bring back Maj. Gen. Mason M. Patrick and Maj. H. A. Dargue to Carlstrom Field. As the last two DeHavilands had left for Montgomery two days before, it was necessary to make the trip to Miami in Hissos. Major Royce and Lieutenant Corkille left on Saturday morning and arrived in Miami at noon, having gassed at LaBelle. General Patrick arrived about noon, and was entertained by Mr. Sewall, President of the Miami Chamber of Commerce, who showed him all the sights of Miami and Miami Beach. Chapman Field was inspected and an elaborate luncheon was served at Mr. Sewall's home. At four o'clock the party arrived at the flying field, and preparations were made for the flight across the Glades. Lieutenant Corkille was scheduled to pilot General Patrick but at the very last moment, while starting his ship, was hit by a propeller and, although not seriously injured, was rendered extremely faint, so Major Dargue piloted the General and Major Royce brought Lieutenant Corkille back.

A stop was made for gas at LaBelle, where another ship and a mechanic with gas was awaiting the party. From LaBelle on most of the trip was made through a rain storm which got quite heavy as the field was neared. During his stay at Carlstrom General Patrick was the guest of Major and Mrs. Royce and enjoyed the meals at the Officers' Club. Early Monday morning the General inspected their morning instruction. Following this he received a committee of business men from Arcadia, making arrangements for a larger meeting to follow the next morning. He then made a trip by air to Dorr Field and from there to Arcadia and Nocatee and back to Carlstrom, piloted by Major Royce. The afternoon was spent in a thorough inspection of all the shops and barracks and mess halls, followed by a visit to several of the largest orange groves in the vicinity of Arcadia.

General Patrick addressed the business men of the city of Arcadia on Tuesday morning and explained to them the various reasons for moving the field. He then left by plane for Jacksonville at twelve o'clock, Lieutenant Haddon and Sergeant Winston flying the accompanying plane. Stop was made for gas at Sanford and the planes then flew to Daytonia, making the trip from there to Jacksonville at about 200 ft. altitude. Two DH's from Montgomery were awaiting the General at Camp Johnson.

* * *

Army Orders—First. Lieut. Clifford Elleman, A.S., relieved from further duty at Richmond Air Intermediate Depot, Richmond, Va., is assigned to duty at Middletown Air Intermediate Depot, Middletown, Penn.

The resignation of First Lieut. Joseph Ignatius Syllivan, A.S., of his commission as an officer of the Army has been accepted by the President.

The following named enlisted men have been transferred from their respective stations to Brooks Field, Tex., for appointment as Flying Cadets: Pvtes. Igar Sims and Foster V. Tompkins (Bolling Field); Sgt. Goree J. Behrman and Pvte. 1st Cl. George R. Vexenat (Ellington Field); Cpl. Jesse B. Stove (Mather Field); Cpls. William M. Cason and Charles O. Gustafson, Pvte. 1st Cl. Paul E. Macy, 1st Sgt. James Z. Moore, M. Sgt. Walter L. Wheeler (Post Field); Pvtes. 1st Cl. Hall Hudson and Alfred F. Winters, Pvte. Philip T. Searoy (Crissy Field); Pvte. 1st Cl. Adolph Levinson, Q.C.; Pvte. 1st Cl. Leonard P. Canton; Pvte. Samuel S. Goodspeed, Cav.; Cpl. Carey M. Sullivan, F. Art.

Record Flight, San Antonio to Pacific—The following account of the fast airplane flight of Lieutenants Doolittle and Andrews from Kelly Field to the Pacific Coast is given by the Kelly Field Correspondent of the *Air Service News Letter*:

"Lieuts. J. H. Doolittle and L. S. Andrews left Kelly Field at 5.25 a. m., May 4. The trip was made in a DH4B, altered by the 90th Squadron, Engineering Department, under Lieut. Doolittle's direction, with a 130-gal. main gasoline tank and 18-gal. oil tank, complete dual control and instruments, and the compartmented rear fuselage packed with DH and Liberty parts for nearly any contingency that could arise. The new Handley-Page wheels were used. Trials had proven the ship for six hours' continuous flying time.

A few minutes out of this field a heavy fog was encountered. They climbed over this bank which was about 2000 ft. thick, and at 3500 ft. encountered another bank. Flying compass course between these two stratas, they emerged ten miles south of Sanderson, between 225 and 250 miles from the start.

Twenty minutes were lost at El Paso for servicing, and forty minutes at Nogales. From the time that they left the fog at Sanderson through to Rockwell Field, the country seemed enveloped in a light haze, which tended to blur objects on the horizon and render difficult the identification thereof. The total time elapsed between Kelly Field and Rockwell Field was 13 hr. 30 min., 12 hr. 30 min. of which was actual flying time. This constitutes a record flight between the two fields.

The trip from Rockwell to Crissy was made leisurely up the valley, with stops at Los Angeles, Taft and Bakersfield. Several wind and rain storms were encountered between Bakersfield and Crissy Field. The flying time between Rockwell and Crissy Fields was 5 hr. 15 min. With the exception of twenty gallons of gasoline at Los Angeles, no fuel was taken on during this leg.

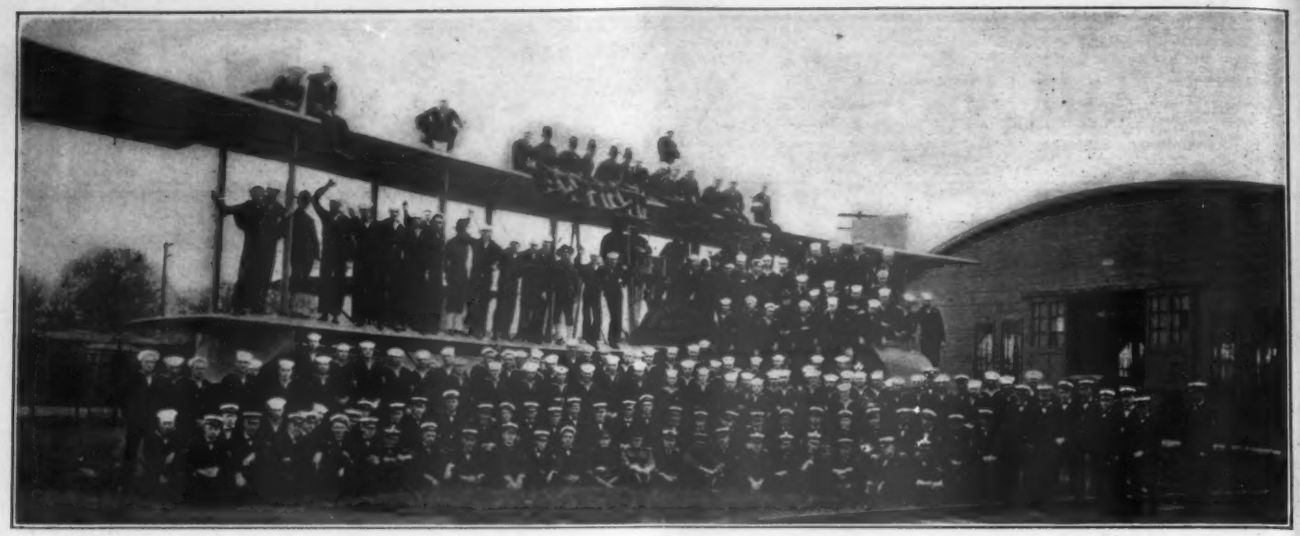
At 1.15 p. m., May 10, the homeward flight was started from Crissy Field, and the hop to Rockwell was made down the coast line in 3 hr. 10 min. At Rockwell it was found necessary to re-rig the ship, all flying and landing wires having been badly stretched by the storm flown through between Bakersfield and San Francisco and the bumpy weather down the coast.

On the morning of May 12 the flight was resumed, a landing being made at Nogales for servicing, thence to El Paso, where the night was spent. At 1.20 p. m., May 13, Mountain Time, the start for Kelly was made. At Marfa, Tex., incipient rain storms and clouds were met, which gradually increased in violence. The center of disturbance was met about 100 miles from San Antonio and, not being able to circle the storm center, they dropped to 200 ft. and fought through it. Twenty miles from Kelly the storm lightened, and abated entirely about ten miles out. The landing was made at dusk (7.40 p. m.) on a dry field, total flying time 34 hr. 35 min.

What is even more remarkable than the excellent time made, even than the quality of flying and navigation demonstrated by both pilots, was the performance of the DH plane and Liberty motor. The only repair made was the changing of an intake valve spring at Rockwell and the cleaning of the oil pump screen at Crissy Field.

Log of motor performance gives the following averages for the trip; r.p.m. 1500, air speed 100 m.p.h., oil pressure 25 to 35 lb., air pressure 3 to 3½ lb., motor temperature 80 deg. Cent.

Lieut. Doolittle is warm in his appreciation of the courtesy shown him by officers and civilians at all fields at which stops were made. He states that it was due mainly to their enthusiastic co-operation that the trip became the success that it did.



Official Photo, U. S. Navy

The personnel of the Aviation Mechanics' School, U. S. Navy, at Great Lakes, Ill.

Wright Aeronautical Corp. Welcomes Air Service Officers—The Wright Aeronautical Corp. of Paterson, N. J., through John R. Cautley of the Sales Department, has extended an invitation to all Regular Army Air Service officers, including reserve officers, to visit that city and inspect their factory. Mr. Cautley states that if such officers who may desire to visit the plant will give the Sales Department (Telephone Lambert 6483) sufficient notice in advance of their coming they will be well taken care of.

In the case of Air Service reserve officers, the Wright Aeronautical Corp. has adopted the same rules as to identification as have been promulgated by the Army Air Service with respect to such officers presenting themselves at Air Service flying fields for the purpose of taking flights. The corporation prefers, however, that reserve officers who are really interested in engines from a military point of view, make their arrangements for visiting the plant through the Commanding Officer of their proper Corps Area, and that they be accompanied to the plant by an Air Service officer of the regular establishment on active duty.

* * *

Kelly Field—Maj. Leo G. Heffernan, Commanding Officer of the 3rd Group (Attack) stationed at Kelly Field, Tex., recently made a cross-country flight to El Paso, Tex., which turned out to be a rather rough ride before its conclusion. The first start, in the Major's own ship, resulted in a forced landing near Donley, Tex., about thirty minutes out. The ship was damaged to such an extent that the return was made by train and the ship brought in by trucks from the 13th Squadron.

The Major again took off in a 26th Squadron ship, with Sergeant Turner as passenger and a compass course was laid from Sabinal. Later the compass failed and the remainder of the journey was flown by land marks. On the return trip severe hail, rain and wind storms were encountered at various stages of the journey. The hail was so large and thrown back with such violence that Major Heffernan's face was skinned and cut painfully.

* * *

Carlstrom Field—Flying training is nearing completion at Carlstrom Field, Arcadia, Fla., and the present class of officers and flying cadets will soon be graduated. This class of Jan. 1 will be the last class to receive primary training in Florida. Out of a class of seventy-nine, three have been graduated (Refreshers); twenty-six have been disqualified by the faculty board, twenty-nine have completed flying training and twenty-seven are still under instruction. These twenty-seven will complete their training within the next two weeks.

Chanute Field—The Air Service Mechanics School at Chanute Field, Rantoul, Ill., was visited on May 19 by a delegation of citizens from Coles County, Ill., headed by Mack Sparks of Mattoon. The delegation assembled at Mattoon, which is 70 miles south of Rantoul, and proceeded to that place by automobile. They assembled at the Business Men's Club at Rantoul where they were joined by a number of Rantoul business men, and were met by a reception committee from Chanute Field, consisting of Maj. F. L. Martin and 1st Lieuts. Frank M. Paul, James Flannery and Russell R. Fox, who conducted them to the field. Upon their arrival, the delegation, which numbered 120 people, were divided into small parties under the direction of an officer, noncommissioned officer or civilian instructor, and were conducted on a tour through the field. Dinner was served at 1.00 p. m. at the Consolidated Mess Hall.

A flying program was given by the pilots of the field at 2.00 p. m., consisting of the following maneuvers: A parade of all types of airplanes on the field. Each machine was taxied past the guests and its characteristics explained before it took the air. There were six types of planes represented in this parade: Fokker, SE5, Thomas Morse MB3, Spad 13, DH4B and Curtiss JN6H. The planes circled the field several times, coming down low as they passed the guests.

The next event was a race around the flying field between all types of ships. The MB3 finished its course (24 miles in length) and landed in time for its pilot, 1st Lieut. Warren R. Carter, to smoke a quiet cigarette before the other entries came lumbering in.

A bombing exhibition was next given, in which two DH4B's, piloted by 1st Lieuts. R. R. Fox and A. G. Hamilton, bombed an imaginary column of troops. The column was then straffed by a ground attack airplane, piloted by 1st Lieut. James S. Eldredge, with 1st Lieut. Owen E. Spruance, Director of the Course for Armorers, as gunner. Much disorder was created among the troops.

The final event was the seven-ship formation of DH4Bs which was attacked by scouts, flown by 1st Lieuts. L. N. Eller and James D. Givens. The rear airplane, piloted by Lieut. W. R. Carter, dropped behind because of motor trouble and was caught by the scouts and shot down. When clear of the formation, a parachute pack, which was attached to the underside of the fuselage of the DH, was released, and contributed very much to the effect. After a series of remarkable sideslips, Lieutenant Carter landed his supposedly injured ship.

At the present time there are 550 students undergoing the various courses of instruction at the Air Service Mechanics School at Chanute Field. This leaves an approximate number of 110 men awaiting instruction. These men will be entered within six weeks.

Pay for Flying Duty—Among the questions that will probably have to go to the comptroller general in the determination of the effect of the doubtful provisions in the new pay legislation will be that concerning the phraseology of section 20 of the act providing "that all officers, warrant officers and enlisted men of all branches of the Army, Navy, Marine Corps and Coast Guard, when detailed to duty involving flying, shall receive the same increase of their pay," etc., as are now authorized "for the performance of like duties in the Army."

The existing law authorizes special aviation pay for those "while on duty requiring regular and frequent participation in aerial flight." The comptroller general's decisions on the law as it now stands have been regarded as somewhat restrictive and severe. The new law applies to those on "duty involving flying" which constitutes a more liberal phrase, but one, nevertheless, that will require a definition, ultimately by the accounting officers. It is also worthy of remark that the existing disposition to limit special aviation pay to members of the air service is extended to include all in the services named who are "detailed to duty involving flying."

This new legislation marks a broader view which aviators have been insisting should be taken in the determination of the special compensation which legitimately attaches to their class of duty.

Naval Aviation

Senate Increases Naval Air Appropriation—The Senate Committee on Naval Affairs has reported the naval appropriation bill with amendments materially improving the measure as it passed the House with regard to aviation.

The Senate recommends continued appropriations for new aircraft and new construction work on hangars. The House refused to allow an enlargement of the naval air service, in spite of the results of the bombing tests last summer, which demonstrated the supreme importance of aircraft as an instrument of naval warfare. The Senate bill brings the total for naval aviation up to $14,703,950, in which is included the sum of $6,537,000 for the construction of 213 new fleet aircraft.

Regarding the naval aviation increases, the committee said that "the absolute importance of the air service as a branch of naval warfare had been demonstrated." The total naval appropriations were $14,703,000, and the report said that $15,000,000 had been appropriated for the Army air service, a total for both of $29,703,000, as compared with aviation budgets of $66,424,000 by Great Britain, $44,600,000 by France and $18,723,000 by Japan.

On June 21 the House and Senate conferees agreed on the inclusion in the Naval Appropriation Bill of the Senate amendment providing $6,537,000 for new aircraft construction.

* * *

Hampton Roads Naval Air Station—The airship C7 made five flights during the past week from Hampton Roads Air Station, including one trip to Annapolis to witness the Army and Navy baseball game. A test for lift in a very rainy day revealed the fact that the C7 lost 810 lb. after being exposed to the rain for twenty minutes. Ens. C. E. Bauch of the Bureau of Aeronautics and Mr. Pickering of the Bureau of Standards reported to Hampton Roads to aid in the C7 tests.

Twenty-three flights, totaling 12 hr. 19 min. were made during the week, including a flight of a F5L to Annapolis and return. The Langley fliers made 40 precision flights, and one landing on the dummy deck.

* * *

Naval Orders—Lieut. William P. Bacon, det. U.S.S. Bridgeport; to Curtiss Aeroplane and Motor Corp., Garden City, L. I. (conn. aircraft inspection).

Lieut. George O. Prise, det. Naval Air Station Pensacola, Fla.; to Bureau of Ordnance, Navy Dept., Washington, D. C.

Lieut. (j.g.) James E. Dyer, det. Naval Air Station Pensacola, Fla.; to duty Naval Air Station Coco Solo, C. Z.

Lieut. (j.g.) Walter A. Brooke, R.F., det. Air Squadrons, Pacific Fleet; to home.

Lieut. (j.g.) Edmund A. Whiting, C.C., det. Inspector of Naval Aircraft Works, G. Elias & Bro., Buffalo, N. Y.; to home.

Lieut. Allen P. Flagg, det. Naval Air Station Pensacola, Fla.; to duty Air Squadrons, Atlantic Fleet.

Lieut. Robert Poole, det. Naval Air Station Pensacola, Fla.; to Naval Air Station Anacostia, D. C.

Lieut. Isaac Schlossbach, det. Naval Air Station Pensacola, Fla.; to duty Air Squadrons, Atlantic Fleet.

Lieuts. (j.g.) Harvey R. Bowes and Stephen E. Haddon, det. Naval Air Station Pensacola, Fla.; to duty Air Squadrons, Atlantic Fleet.

Lieuts. (j.g.) Julian B. Noble and Giles E. Short, det. Naval Air Station Pensacola, Fla.; to duty Naval Air Station Anacostia, D. C.

Ens. Edmond P. Speight, det. U.S.S. J. Fred Talbot; to temp. duty Naval Air Station Pensacola, Fla.

Lieut. Lovern A. Pope, det. Naval Air Station Pensacola, Fla.; to Naval Air Station Anacostia, D. C.

Lieut. (j.g.) Matthias B. Gardner, det. Naval Air Station Pensacola, Fla.; to U.S.S. Wright.

Lieut. (j.g.) Van Rensselaer Moore, det. Naval Air Station Pensacola, Fla.; to Air Squadrons, Atlantic Fleet.

Lieut. (j.g.) Riffel G. Rhoton, det. Naval Air Station Pensacola, Fla.; to Air Squadrons, Atlantic Fleet.

Lieut. (j.g.) John C. Williams, det. Naval Air Station Pensacola, Fla.; to Air Squadrons, Atlantic Fleet.

Lieut. Albert M. Darby, R.F.; to duty Naval Aircraft Factory, Phila., Pa.

Ens. Steadham Acker, det Naval Air Station Pensacola, Fla.; to duty Air Squadrons, Atlantic Fleet.

Lieut. George D. Thompson, (M.C.), det. Naval Hospital Great Lakes, Ill.; to temp. duty Naval Air Station Pensacola, Fla.

Lieut. Grover C. Wilson, (M.C.), det. Naval Hospital Norfolk, Va.; to temp. duty Naval Air Station Pensacola, Fla.

Lieut. Robert B. Huff, (S.C.), det. Naval Helium Production Plant Fort Worth, Tex.; to R. Barracks Hampton Roads, Va.

Lieut. (j.g.) Edward Mixon, S.C., supply and disbursing officer, Naval Helium Production Plant, Fort Worth, Tex.

Coming Aeronautical Events

AMERICAN

Sept. 4 — Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)

Sept. 30 — First Annual Interservice Championship Meet. (In preparation.)

Oct. 12-14 — Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)

FOREIGN

August — Coupe Jacques Schneider. (Seaplane speed race.) Naples, Italy.

August — Tyrrhenian Trophy. (International Seaplane Competition.) Naples, Italy.

Aug. 6 — Gordon Bennett Balloon Race, Geneva, Switzerland.

Aug. 6-20 — Soaring and Gliding Competition, Clermont-Ferrand, France.

Aug. 9-24 — Soaring and Gliding Competition, Gersfeld, Germany.

September — Grand Prize of Italy. (International Airplane Competition.) Milan, Italy.

Sept. 22 — Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.
American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

October — International Parachute Competition. Rome, Italy.

Foreign News

The Netherlands—The Royal Aerial Navigation Co. of the Netherlands (K.L.M.), has published figures covering its services in 1921. During that year 842,937 kg. of mail, 24,874,505 kg. of goods, and 489 passengers were carried by the Amsterdam-London line. On the Amsterdam-Brussels-Paris line traffic amounted to 346,203 kg. of mail, 11,141,420 kg. of goods, and 931 passengers. On the Rotterdam-Hamburg service 358,545 kg. of mail, 2,517,630 kg. of goods and 254 passengers were carried. These figures show a very significant increase over the 1920 returns, the latter totalling less than 1 per cent of the 1921 traffic in the case of mails and goods and only 21 per cent in the number of passengers.

The daily Amsterdam-London service of the Royal Aerial Navigation Co., discontinued during the winter, was resumed on April 18. A new set of passenger and freight rates, representing an appreciable reduction from those of 1920 and 1921, have been put into effect. Passenger rates have been reduced to 75 guilders from the 150 guilders in effect during 1920. In that year the maximum freight charges were 2.50 and the minimum charge 1.50 guilders per kilo, whereas the present rate is 1.50 guilders for the first kilo, with a rate of 1 guilder for each additional kilo and a special rate of 0.80 guilder per kilo on large quantities.

The Netherlands Government has not yet taken any action toward renewing the subsidy granted the Royal Aerial Navigation Co. in 1921.

* * *

Germany—The Bayerischer Luft-Lloyd, a Munich concern, resumed its daily mail and passenger service between Munich and Constance, on Lake Constance, on April 1 according to Consul Wm. Dawson at Munich. Planes leave Munich at 2.15 p. m. and arrive at Constance at 3.45 p. m. Returning the same day, leaving Constance at 4.10 and arriving at Munich at 5.40. The Bayerischer Luft-Lloyd has various types of planes, including Junkers six-passenger limousines and open planes carrying one or two passengers. The single fare to Constance is 1000 Mks., round trip 1800 Mks. Excursions are also planned to the vicinity of Munich and the Bavarian Alps in closed Junker planes.

Although the number of airplanes in use was negligible during the past year, seven German companies claim to have covered a total of 1,653,053 km. during the seven months from April to November, 1921, carrying 6,183 passengers and 30,713,428 kg. of post and parcels. Commercial Attache C. E. Herring, Berlin.)

* * *

Great Britain—Compulsory use of parachutes on all passenger-carrying aircraft is a decision of the Air Ministry which will shortly be made public. At present the airway companies carry lifebelts for their passengers when crossing the seas, but none has yet thought fit to equip its airliners with aerial life buoys.

It is pointed out that at least 2000 lives were saved during the war by means of parachutes used with kite balloons and, although no form of transport can ever be free from accident and constant risk of accident, the peculiar nature of air travel makes it incumbent that no possible means of safety should be ignored.

* * *

Argentina—It is estimated that there are 173 airplanes in Argentina, of which 53 belong to the army. Of the total number, 88 are French, 30 are American, 24 are British, 4 are Italian, 11 are German and 16 are of various makes. The Compania Rio Platense de Aviacion made 84 trips and carried 281 passengers between Buenos Aires and Montevideo up to March 1. The cost of the round trip between the two cities is 140 pesos, including the automobile transportation to and from the field. The time of flight is 1 hr 45 min., in contrast to the trip of 9 hr. by boat which costs 45 pesos. (Trade Commissioner George S. Brady, Buenos Aires)

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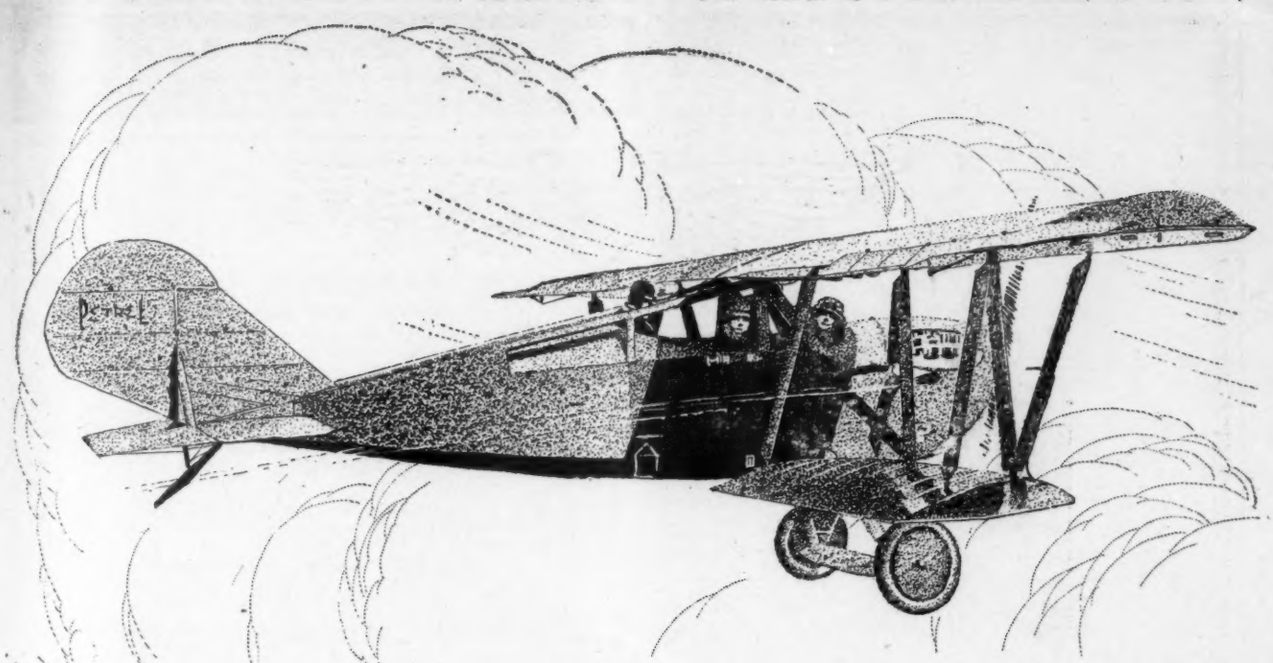

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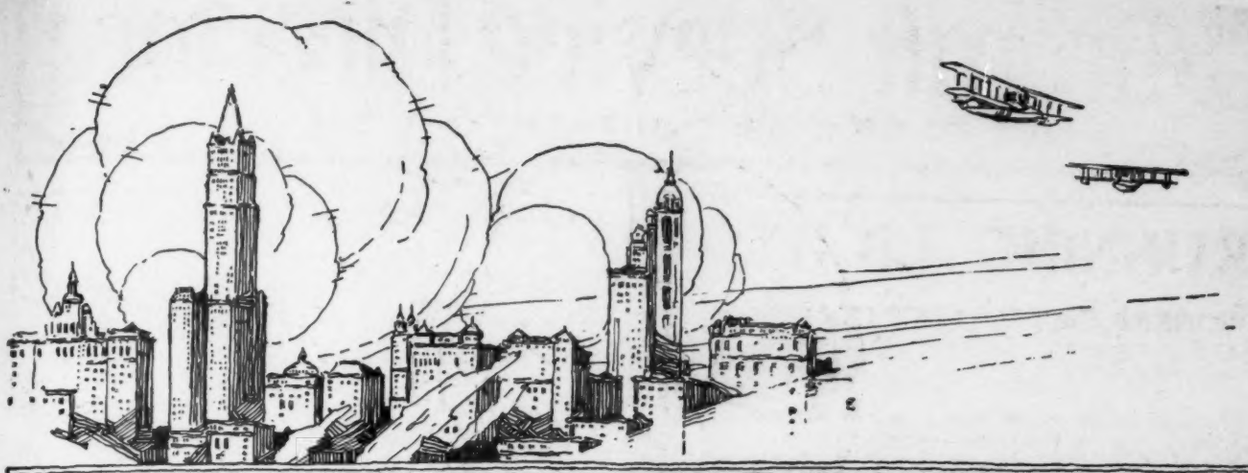

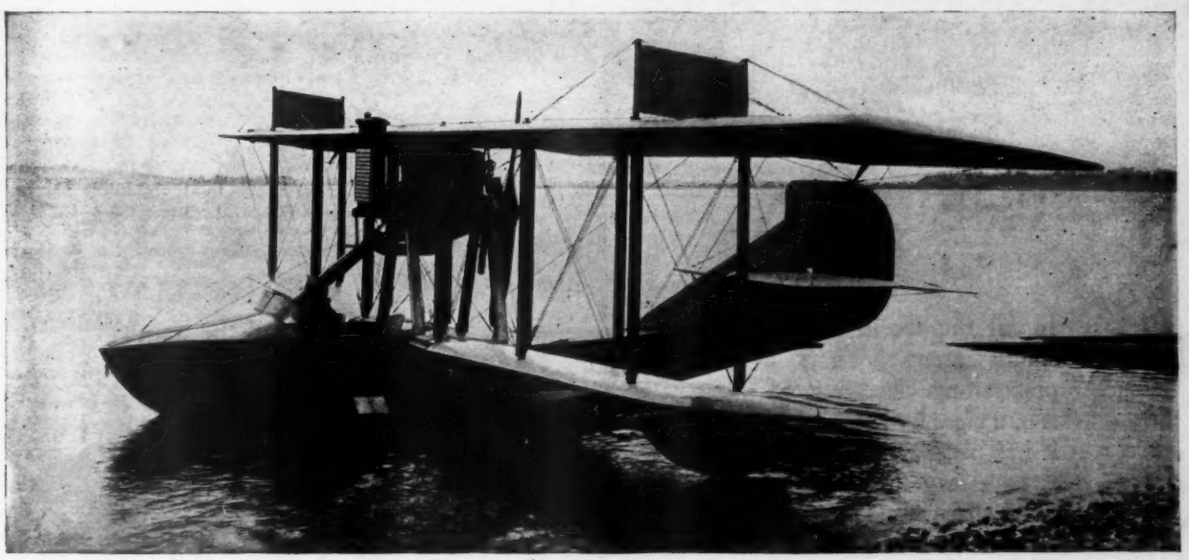

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